This Report revises the draft "Southwest Coastal Louisiana Draft Integrated Feasibility Report and Programmatic Environmental Impact Statement" which was previously released in December 2013 and contains modified Tentatively Selected Plans (TSP) for the National Economic Development (NED) and National Ecosystem Restoration (NER) components of the Study.

The people, economy, environment, and cultural heritage of coastal areas in Southwest Louisiana are at risk from damages caused by hurricane and storm surge flooding. Southwest coastal Louisiana's topography, and low elevation, proximity to the Gulf of Mexico, subsiding lands, and rising seas, are all contributing factors which cause coastal flooding, shoreline erosion, saltwater intrusion, and loss of wetland and Chenier habitats which are conditions that are expected to continue to worsen.

Through separate reciprocal authorizations, Congress authorized the investigation of alternatives to: (1) provide hurricane protection and storm damage reduction, and (2) significantly restore environmental conditions. Planning to address hurricane protection and storm surge damage reduction (the NED component) was primarily focused on communities and areas located north of the Gulf Intracoastal Waterway (GIWW), but measures for all at-risk structures both inside and outside of the coastal zone were considered. Planning measures for ecosystem restoration (the NER component) concentrated exclusively on locations within the coastal zone.

The SWC study area encompasses over 4,700 square miles of varying terrain in the Calcasieu, Cameron, and Vermilion Parishes). The major physiographic divisions are the Gulf Coast Prairies and the Gulf Coast Marsh. The major hydrologic basins in the Study Area are the Mermentau River, the Calcasieu-Sabine Lakes, and the Teche/Vermilion Basin. Dominant water features in the Study Area are the Calcasieu, Sabine, Neches, Mermentau, and Vermilion Rivers and Calcasieu, Sabine, Grand, and White Lakes. Man-made channels in the Study Area are the Sabine-Neches Waterway, Calcasieu Ship Channel, GIWW, Mermentau Ship Channel, and Freshwater Bayou Canal. The channels and waterways, except for the GIWW, are oriented north to south along the Gulf coast.

The GIWW is the longest channel crossing the Study Area and generally runs along the State's coastal zone boundary. Water control structures in the Study Area are the Calcasieu and Leland Bowman Locks, the Freshwater Bayou Canal Lock, the Schooner Bayou Canal Structure, and the Catfish Point Control Structure. Key highways in the Study Area are LA-82 and LA-27 and I-10. Population centers are mainly north of the GIWW, and include the largest municipalities of Lake Charles, Sulphur, and Abbeville.

The Project Delivery Team (PDT) used information from prior Federal, state, and local efforts to focus the Study on the most critical areas. System-wide problems and opportunities were used to identify and define site-specific problems and opportunities. Problems in the SWC study area include:

- Flooding from tidal surge and waves associated with hurricanes and tropical storms.
- Increased flood durations in wetlands, resulting in wetland loss.
- Erosion of channel banks and shorelines, resulting in wetland loss.
- Deforestation and mining of chenier ridges.

Opportunities to solve these problems include:

- Incorporate structural and nonstructural coastal storm damage risk reduction measures to reduce the risk of damages and prevent loss of community cohesion.
- Improve internal system hydrology to restore wetlands.
- Manage salinity levels to maintain fresh and intermediate marsh.
- Reduce bank and shoreline erosion.
- Prevent loss of significant historic and cultural resources.

The PDT developed the following five planning objectives for the 50-year period of analysis (2025-2075):




- *Objective 1.* Reduce the risk of damages and losses from hurricane and storm surge flooding.
- *Objective 2.* Manage tidal flows to improve drainage and prevent salinity from exceeding 2 parts per thousand (ppt) for fresh marsh and 6 ppt for intermediate marsh.
- *Objective 3.* Increase wetland productivity in fresh and intermediate marshes to maintain function by reducing the time water levels exceed marsh surfaces.
- *Objective 4.* Reduce shoreline erosion and stabilize canal banks to protect adjacent wetlands.
- *Objective 5.* Restore landscapes, including marsh, shoreline, and cheniers to maintain their function as wildlife habitat and improve their ability to serve as protective barriers.

The following planning constraints to be avoided or minimized were identified:

- *Commercial navigation.* The Calcasieu and Sabine ship channels and the GIWW carry significant navigation traffic. Therefore, features that might result in shipping delays or undermine the purposes of authorized navigation projects would likely result in negative National Economic Development (NED) impacts.
- *Federally listed threatened and endangered species and their critical habitats.* Construction windows for resident and migratory species overlap and/or may include the entire year: piping plover, Gulf sturgeon, red-cockaded woodpecker, red knot, whooping crane, West Indian manatee, and several species of sea turtles.
- *Essential fish habitat (EFH), especially intertidal wetlands.* Conversion of one EFH type to another should be done without adversely impacting various fish species. For example, conversion of shallow open water EFH to marsh EFH.
- *Cultural and historic resources.* Archeological sites and standing structures have been identified in the area, including properties eligible for or listed in the National Register of Historic Places, as well as potentially eligible sites and structures.

National Economic Development (NED) Planning

Hurricane and storm damage risk reduction measures were developed and screened using preliminary costs and benefits to identify a focused array of NED alternatives. In addition to the "No Action" alternative, the focused array contained three levee alignments in the Lake Charles area; three levee alignments around the towns of Abbeville, Delcambre, and/or Erath; and two stand-alone nonstructural alternatives.

NED Focused Array includes:

- No Action
- Lake Charles Eastbank
- Lake Charles Westbank Sulphur Extended
- Lake Charles Westbank Sulphur South
- 100-year Floodplain [(1% Annual Chance Exceedance (ACE)] Nonstructural Plan
- Delcambre/Erath
- Abbeville to Delcambre
- Abbeville
- Nonstructural Justified Reaches Plan

The assessment of economic feasibility for six independent structural measures was conducted in the focused array analysis. As a result of this additional evaluation, none of the structural levee alignments were found to be economically justified and none were carried into the final array. The evaluation of the focused array determined that the most cost-effective solution to reduce hurricane and storm surge flood-risk within the study area is through nonstructural measures. The No Action Plan, Plan 7 "Nonstructural - Justified Reaches Plan" (based on 11 economically justified reaches) and Plan 8 were carried into the final array with Plan 7 being selected as the NED TSP in the draft 2013 report.

After the release and receipt of comments on the December 2013 Initial Draft Report, structures in the 0-10-year floodplain were added to the structure inventory and additional economic calculations were performed to determine whether the addition of these repetitive flood risk structures resulted in a positive net NED benefits and has a positive benefit/cost ratio. The revised evaluation of nonstructural measures consisted of evaluating every structure in the revised inventory, with a FFE below the 100-year stage for water surface elevations (WSEs) prevailing in the year 2025 rather than the year 2075. The revised NED TSP will provide reduced flood risk for a total of 4,952 total impacted structures (based on expected 2025 conditions)

comprised of 4,219 residential structures, 396 commercial structures and public buildings, and 337 warehouses. The expected average annual net benefits are approximated at $231.6 million dollars, with $824,000,000 in first costs, and a benefit/cost ratio of 7.74:1. Note: Subsequent NEPA documents will analyze in detail site specific Project benefits and impacts as the nonstructural program is implemented.

A brief summary of the components of the NED TSP include:

1. Elevation of eligible residential structures. This measure requires lifting the entire structure or the habitable area to the predicted 2075, 100-year base flood elevation unless the required elevation is greater than a maximum of 13 feet above ground level.
2. Dry flood proofing of eligible non-residential structures (excluding large warehouses and industrial complexes). Dry flood proofing consists of sealing all areas below the flood protection level of a structure to make it watertight and ensure that floodwaters cannot get inside by making walls, doors, windows and other opening impermeable to water penetration.
3. Construction of flood proofing barriers or berms less than 6 feet in height around non-residential structures, primarily industrial complexes and warehouses. These measures are intended to reduce the frequency of flooding but not eliminate floodplain management and flood insurance requirements.
4. Floodplain Management Plans. The NFS is required to prepare a Floodplain Management Plan in coordination with USACE to maintain the integrity of the project; however the NFS should work with the governing bodies within the three parishes to ensure consistency with local development plans and regulations.
5. Adoption of more stringent local floodplain regulations. Although communities within the study area cannot change the minimum NFIP standards, the NFS should work with the local governments to adopt local standards that achieve higher levels of flood risk reduction, such as replacing elevation requirements based on the 100-year to the 500-year; Implementing a zero rise floodway; and adopting cumulative damages as the trigger for substantial damage determination.
6. Adoption of more restrictive parish and municipal building codes, land use & zoning regulations. and other developmental controls. Local governments within the floodplain should be encouraged to adopt and implement and enforce stricter building and housing code requirements, and land use and zoning regulations and other developmental controls aimed at reducing flood risk and flood damage.

National Ecosystem Restoration (NER) Planning

NER plan screening was based on monetary and non-monetary evaluations. Preliminary costs and benefits for marsh restoration, shoreline protection, chenier reforestation, oyster reef preservation, and water control were estimated. Screening criteria included planning constraints; support for objectives; measure effectiveness; and below average efficiency. Measures that did not meet the screening criteria were retained only in limited instances in which they supported critical adjacent features.

Alternative plans were created by combining measure types into comprehensive strategies. The measures include hydrologic and salinity control, marsh restoration, shoreline protection, and chenier reforestation. The NER focused array contains a "No Action" alternative and 27 other plans that were based on 8 restoration strategies.

NER Strategies:

- No Action
- Large Integrated Restoration
- Moderate Integrated Restoration (Hydrologic Emphasis)
- Moderate Integrated Restoration, including Gum Cove Lock
- Small Integrated Restoration
- Interior Perimeter Salinity Control
- Marsh and Shoreline (Minimal Hydrologic & Salinity Control)
- Entry Salinity Control

Scales and combinations of these strategies were developed resulting in 28 NER alternatives in the focused array. Benefits in the Calcasieu-Sabine Basin were considered separately from the Mermentau/Teche-Vermilion Basin. Benefits were also considered jointly as comprehensive plans. Alternatives were evaluated for cost effectiveness and incremental costs.

The NER TSP is "Small Integrated Restoration" known as the NER Plan CM-4 and consists of 51 ecosystem restoration features (9 marsh restoration features; 35 chenier reforestation features; 5 shoreline protection features; and 1 hydrologic/salinity control feature). The NER TSP is a cost-effective, comprehensive ecosystem restoration plan that addresses land loss and ecosystem degradation. The Plan is the least-cost comprehensive "best buy" plan which addresses the goals of minimizing land loss. The NER TSP contains features to restore 15,581 acres of wetlands; restore and protect 341 acres of designated critical habitat (for threatened piping plover and red knot); enhance plant productivity; and reinforce and protect critical landscape features. The Calcasieu Ship Channel Salinity Barrier Navigation Study is recommended as an additional long-range study. The NER Plan first construction cost estimate is ~$988,000,000. The Revised Draft Report provides greater detail for the NER features which are now recommended for construction.